NOTES ON PEPEROMIA (PIPERACEAE) IN THE SOUTHEASTERN UNITED STATES

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The Piperaceae consist of approximately 4000 species distributed in the tropics and subtropics of both the Old and New Worlds. A few species reach temperate latitudes in eastern Asia, where *Piper kadsura* extends to about 35°N latitude, and off the eastern coast of North America, where the family is represented on Bermuda at about 32°20′N latitude. Both regions have climates that are modified by warm oceanic currents. Three species of *Peperomia* are apparently native in Florida, and about five additional species have been collected as growing "wild" in the southeastern United States or have at least been attributed to that region.

The Piperaceae were first recorded in the continental United States in 1822, when Nuttall described *Piper leptostachyon* (= *Peperomia humilis* A. Dietr.) from eastern Florida. Chapman did not include the family in the first edition of his *Flora of the Southern United States* (1860); his first mention of them was in 1883, when he listed two species of *Peperomia* (*P. magnoliaefolia* (Jacq.) A. Dietr. and *P. leptostachya* (Nutt.) Chapman) in the supplement at the back of the second edition of his *Flora*. The Garber collection that he called *P. magnoliaefolia* is actually *P. obtusifolia*. Small (1903) treated the same two species in his *Flora*, as well as five species in the genera *Micropiper* and *Rhynchophorum* (both now considered synonyms of *Peperomia*) in his *Manual* (1933). Long and Lakela (1971) recognized six species of *Peperomia* as growing naturally in South Florida. Further discussion on the history of the discovery of *Peperomia* in Florida can be found in a paper by Small (1931).

In the treatment of the Piperaceae for the *Vascular Flora of the Southeastern United States*, I am recognizing eight species of *Peperomia* and two species of *Piper* as growing naturally (or at least as having been collected outside of cultivation) in this region. In the Southeast all but one are restricted to Florida. The following nomenclatural notes that could not be included in the format of that publication are an attempt to provide synonymy for the species of *Peperomia* occurring in the southeastern United States. Additional notes as an aid to the identification of the species and reasons for a taxon's inclusion in the flora of this area are also given. Dot maps for the taxa in the Southeast (based on specimens at A, FLAS, FSU, GH, LSU, NCU, NLU, NY, SMU, USF, and VAL), maps to show the distribution of those taxa in the West Indies (based on specimens at A and GH), and keys to the genera of Piperaceae and the species of *Peperomia* in the southeastern United States are provided.

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For convenience the species are listed in alphabetical order. A finding list of synonyms and currently accepted names is included as an appendix.

KEY TO THE GENERA OF PIPERACEAE IN THE SOUTHEASTERN UNITED STATES

1. Shrubs or small trees; floral bracts fringed with whitish hairs. ..... *Piper*.
1. Herbs; floral bracts glabrous, sometimes covered with glandular dots. ..... *Peperomia*.

KEY TO THE SPECIES OF PEPEROMIA

1. Stems pubescent; leaves opposite or whorled. ..... *P. humilis*.
1. Stems glabrous; leaves alternate.
   2. Plants covered with numerous black, glandular dots. ..... *P. glabella*.
   2. Plants without black, glandular dots, occasionally leaves with yellowish resinous or pellucid dots.
      3. Leaves broadly cuneate, attenuate, or acuminate at base, tapering smoothly to petiole.
         4. Beak of fruit mammiform or conical, less than 0.2 mm long; leaves elliptic, lanceolate, or oblanceolate; petioles slightly dilated and clasping at base, decurrent in lines or wings along stem. ..... *P. alata*.
         4. Beak of fruit elongate, 0.5–1 mm long; leaves obovate, spatulate, or ovate; petioles not dilated at base, if appearing to be clasping then not decurrent in lines along stem.
            5. Peduncles with microscopic, spiculelike hairs; beak of fruit filiform above conical base, abruptly hooked near apex. ..... *P. obtusifolia*.
            5. Peduncles glabrous; beak of fruit tapering smoothly from broadened base to sharply acute apex, straight, bent, or gradually hooked from about the middle. ..... *P. magnoliifolia*.
      3. Leaves rounded, truncate, cordate, or auriculate at base.
         6. Leaves auriculate at base, sessile or subsessile and more or less clasping the stem. ..... *P. amplexicaulis*.
         6. Leaves rounded, truncate, or cordate at base, petiolate, never clasping the stem.
            7. Leaves less than 5 mm long, orbicular to depressed-orbicular, pubescent; plants creeping. ..... *P. emarginella*.
            7. Leaves more than 6 mm long, broadly ovate to deltate, glabrous; plants erect. ..... *P. pellucida*.

Peperomia alata Ruiz & Pavon, Fl. Peruv. Chil. **1:** 31. 1798.

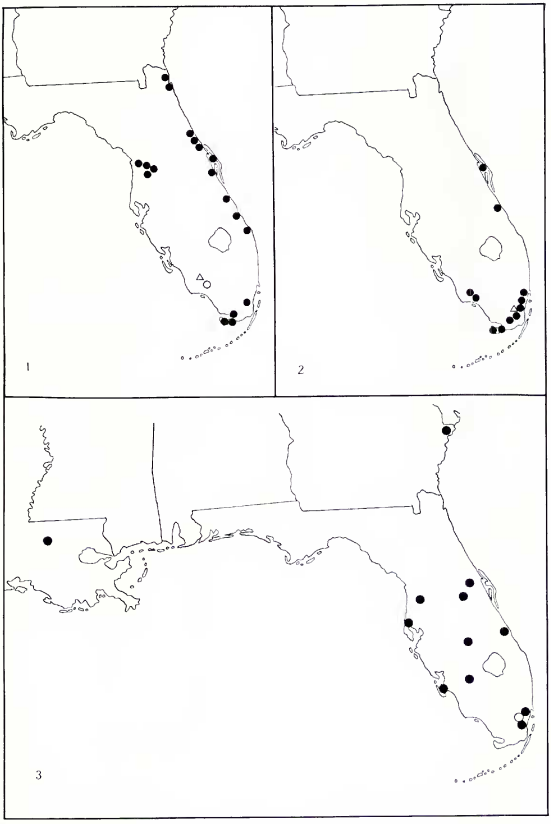
MAPS 1, 4.

The single specimen seen, labeled "Florida, Collier County, Big Cypress Swamp, W of Deep L., 5 February 1939, *W. C. & M. W. Muenscher 14219*" (NY), is tentatively attributed to this species. *Peperomia alata* is common and widespread in Central and South America and in the Lesser Antilles. The characteristic wings on the stem of this specimen are not as conspicuous as on many plants from those areas, but otherwise it matches *P. alata* well.

Peperomia amplexicaulis (Sw.) A. Dietr. in L. Sp. Pl. ed. 6. **1:** 144. 1831.

MAPS 3, 5.

Piper amplexicaule Sw. Prodr. 16. 1788.



Maps 1–3. Distribution of *Peperomia* in the southeastern United States: 1, *P. alata* (circle), *P. glabella* (triangle), *P. humilis* (dots); 2, *P. magnoliifolia* (triangle), *P. obtusifolia* (dots); 3, *P. amplexicaulis* (circle), *P. pellucida* (dots).

According to Adams (1972), *Peperomia amplexicaulis* is endemic to Jamaica. However, it has been collected once in Florida (Dade County, near Cutler, *W. G. Atwater 626,* FLAS). In size and habit it resembles *P. magnoliifolia* and *P. obtusifolia,* but it can be recognized by the narrowly to broadly oblanceolate, sessile to subsessile, auriculate, and more or less clasping leaves.

Peperomia emarginella (Sw. ex Wikström) C. DC. Prodr. **16**(1)**:** 437. 1869. MAP 6.

Piper emarginella Sw. ex Wikström, Kongl. Vetensk. Acad. Handl. **1827:** 56. 1828.

Peperomia emarginella is easily recognized by its small size, creeping habit, short spikes, and orbicular to suborbicular leaves, which are loosely covered with rather long, multicellular hairs. The single specimen, labeled only "Alto, 7-16-1915, *F. & S. 8725*" (NY), was included in a loan from NY of Piperaceae from the southeastern United States and is the basis for the inclusion of *P. emarginella* here; presumably Alto is a location in the Southeast. *Peperomia emarginella* occurs in northern South America, Central America, and the West Indies.

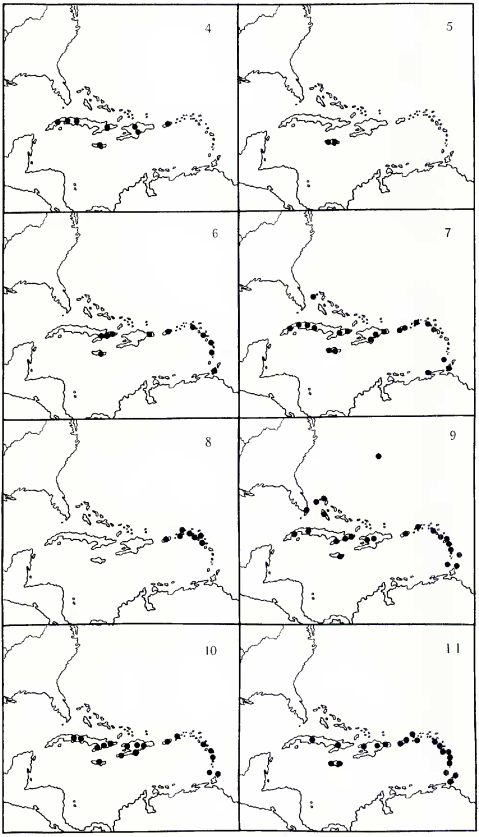
Peperomia glabella (Sw.) A. Dietr. in L. Sp. Pl. ed. 6. **1:** 156. 1831. MAPS 1, 7.

Piper glabellum Sw. Prodr. 16. 1788.

Peperomia glabella is easily recognized by the numerous black dots that cover all parts of the plant. The upwardly curving hairs in lines on the petioles, and often also in thin lines on the stem below the nodes, separate it from *P. nigropunctata,* a more southern species not known from the southeastern United States. *Peperomia glabella* may be a recent introduction to the United States; the only collection I have seen was collected in Collier County, Florida, in 1960 (*F. C. Craighead s.n.; USF 61938*). The plant is common throughout the West Indies.

Peperomia humilis A. Dietr. in L. Sp. Pl. ed. 6. **1:** 168. 1831. MAPS 1, 8.

Piper leptostachyon Nutt. Am. Jour. Sci. **5:** 287. 1822. TYPE: East Florida, November, 1821, *A. Ware s.n.* (holotype, not seen; isotype, GH).
Piper humile Vahl, Enum. Pl. **1:** 349. 28 June 1804, not Miller ex Poiret in Lam. Encycl. Méth. **5:** 473. 11 January 1804.
Peperomia leptostachya (Nutt.) Chapman, Fl. So. U. S. ed. 2. 645. 1883, not Hooker & Arnott, Bot. Beechey Voy. 96. 1832.
Peperomia cumulicola J. K. Small, Jour. New York Bot. Gard. **22:** 197. 1921.
Micropiper humilis (Vahl) J. K. Small, Man. SE. Fl. 400. 1933.
Micropiper leptostachyon (Nutt.) J. K. Small, Man. SE. Fl. 400. 1933.
Peperomia questeliana Stehlé & Trel. in Stehlé, Candollea **8:** 77. 1940.



MAPS 4–11. Distribution in the West Indies of the species of *Peperomia* found in Florida: 4, *P. alata*; 5, *P. amplexicaulis*; 6, *P. emarginella*; 7, *P. glabella*; 8, *P. humilis*; 9, *P. magnoliifolia*; 10, *P. obtusifolia*; 11, *P. pellucida*. Based on specimens at A and GH.

Even though *Piper humile* Vahl is illegitimate because it is a later homonym of *Piper humile* Miller ex Poiret, the epithet *humilis* may still be used in *Peperomia*. Article 72 of the International Code of Botanical Nomenclature states that "When a new epithet is required, an author may adopt an epithet previously given to the taxon in an illegitimate name if there is no obstacle to its employment in the new position or sense; the epithet in the new combination is treated as new." The situation here is exactly parallel to the example given in the Code under Article 72. The name *Peperomia humilis* is treated as new, and the binomial must be cited as *Peperomia humilis* A. Dietr., not *Peperomia humilis* (Vahl) A. Dietr.

This is apparently the same plant that is known as *Peperomia questeliana* Stehlé & Trel. in the Lesser Antilles (see Howard, 1973). Comparison of material from Florida with specimens from the West Indies shows no recognizable differences. Even without type material, this species can be unmistakably identified from Nuttall's original description since *P. humilis* is the only species of Piperaceae in Florida with opposite leaves and pubescent stems.

Small (1933) separated *Micropiper humilis* and *M. leptostachyon* on the basis of differences in leaf shape, bract margins, and habitat. While the extremes in leaf shape appear to be discontinuous, there are many plants that are intermediate. I could find no differences in bract margins, and although different populations of *P. humilis* may appear to grow in two distinct types of habitats in Florida, label data on specimens from other parts of the range indicate that plants of this species occupy a wide variety of habitats.

Peperomia magnoliifolia (Jacq.) A. Dietr. in L. Sp. Pl. ed. 6. **1:** 153. 1831. MAPS 2, 9.

Piper magnoliaefolium Jacq. Collect. **3:** 210. 1798.

Peperomia spathulifolia J. K. Small in Britton & Millsp. Bahama Fl. 101. 1920. TYPE: "Abaco, in coppice at Eight Mile Bay, dry woods, Florida; Haiti."

Rhynchophorum spathulifolium (J. K. Small) J. K. Small, Man. SE. Fl. 1504. 1933.

Peperomia magnoliifolia is similar in appearance to *P. obtusifolia*, and it is often difficult to distinguish between the two species. *Peperomia magnoliifolia* lacks the microscopic hairs on the peduncles, and contrary to reports that the beak of the fruit is straight, I have found this character to be variable. The beak may be straight, curved, or gradually hooked from about the middle, but not abruptly hooked from near the apex as in *P. obtusifolia*. Also, the beak is subulate from a broadened base in *P. magnoliifolia* but filiform for most of its length above a broadened base in *P. obtusifolia*.

Although Small did not designate a type when he described *Peperomia spathulifolia*, photographs at A of two specimens labeled "Abaco, Eight Mile Bay, *L. J. K. Brace 1876*" (NY) and five sheets labeled "Florida, Dade County, Hattie Bauer Hammock, *J. K. Small & C. A. Mosier 5940*" (FSU; GH, 2 sheets; NY, 2 sheets) are probably the basis of the original description. One of the Small and Mosier collections at NY has "Type" written in the upper right corner of the label.

These specimens are not significantly different from *Peperomia magnoliifolia*. The spikes tend to be slightly narrower and more numerous than on most plants of *P. magnoliifolia*, but other characters appear identical. The slender, nodding, branched spikes and cuneate to spatulate leaves are used by Long and Lakela (1971) to separate the two species. The nodding spikes, however, tend to become more erect and rigid as they mature, and sheets of *P. magnoliifolia* from the West Indies occasionally show plants with branched inflorescences. Leaf shape in *Peperomia* is often highly variable and is unreliable in separating closely related taxa.

Peperomia magnoliifolia is a common and widespread West Indian plant and occurs northward to Bermuda. All of the collections I have seen from the southeastern U. S. are from Dade County, Florida, where the species appears to be restricted to only two stations, Hattie Bauer Hammock and Burden's Hammock (see Ward, undated). The two earliest collections I have seen are: Burden's Hammock, 23 February 1905, *A. A. Eaton 1218* (GH; NCU); Hattie Bauer Hammock, 18 March 1915, *J. K. Small & C. A. Mosier 5940* (FSU; GH, 2 sheets; NY, 2 sheets).

Peperomia obtusifolia (L.) A. Dietr. in L. Sp. Pl. ed. 6. **1:** 154. 1831.
MAPS 2, 10.

Piper obtusifolium L. Sp. Pl. **1:** 30. 1753.
Peperomia floridana J. K. Small, Torreya **26:** 109. 1926. TYPE: Florida, Dade County, Ross' Hammock near Silver Palm School, 12 November 1906, *J. K. Small & J. J. Carter 2478* (holotype, NY).
Rhynchophorum floridanum (J. K. Small) J. K. Small, Man. SE. Fl. 1504. 1933.
Rhynchophorum obtusifolium (L.) J. K. Small, Man. SE. Fl. 1504. 1933.

The microscopically puberulent peduncles and the fruits with filiform, abruptly hooked beaks separate *Peperomia obtusifolia* from *P. magnoliifolia*. There is also a slight difference in fruit shape: the fruits of *P. obtusifolia* tend to be cylindrical while those of *P. magnoliifolia* are ellipsoid. Small described *P. floridana* without distinguishing it from other species. In his *Manual* (1933) he separated it from *P. obtusifolia* on the basis of leaf size and shape and included *P. magnoliifolia* "of Chapman's Flora" as a synonym. The size and shape of the leaves, characters frequently used by Small in separating species of *Peperomia*, break down when large numbers of specimens are examined. *Peperomia obtusifolia* is common in the West Indies and is probably native to southern Florida.

Peperomia pellucida (L.) HBK. Nova Gen. Sp. Pl. **1:** 53. 1816.
MAPS 3, 11.

Piper pellucidum L. Sp. Pl. **1:** 30. 1753.

Howard (1973) states that *Peperomia pellucida* is the only truly weedy species of *Peperomia* in the Lesser Antilles. It is apparently a recent introduction in the southeastern U. S. (first collected in 1957) and seems to show weedy tendencies there also. Since the time of the original collection in the

Southeast, the species has been found in several scattered localities in Florida as well as in Georgia and Louisiana, most often around nurseries and greenhouses, but also in shaded woods. It will be interesting to see if this plant will continue to expand its range.

Peperomia simplex Ham. Prodr. Pl. Indiae Occ. 2. 1825.

Long and Lakela (1971) attribute this species to southern Florida, but I have seen no specimens from the Southeast. A single sheet of *Peperomia pellucida* at USF was originally misidentified as *P. simplex*, and it may be that Long and Lakela accepted this name but obtained the description for their *Flora* from other sources.

ACKNOWLEDGMENTS

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APPENDIX. **Finding list.***

Micropiper humilis = **Peperomia humilis**
Micropiper leptostachyon = **Peperomia humilis**

*Recognized species of *Peperomia* are in boldface type, synonyms in italics.

Peperomia alata Ruiz & Pavon
Peperomia amplexicaulis (Sw.) A. Dietr.
Peperomia cumulicola = **Peperomia humilis**
Peperomia emarginella (Sw. ex Wikström) C. DC.
Peperomia floridana = **Peperomia obtusifolia**
Peperomia glabella (Sw.) A. Dietr.
Peperomia humilis A. Dietr.
Peperomia leptostachya = **Peperomia humilis**
Peperomia magnoliifolia (Jacq.) A. Dietr.
Peperomia obtusifolia (L.) A. Dietr.
Peperomia pellucida (L.) HBK.
Peperomia questeliana = **Peperomia humilis**
Peperomia spathulifolia = **Peperomia magnoliifolia**
Piper emarginella = **Peperomia emarginella**
Piper glabellum = **Peperomia glabella**
Piper humile = **Peperomia humilis**
Piper leptostachyon = **Peperomia humilis**
Piper magnoliaefolium = **Peperomia magnoliifolia**
Piper obtusifolium = **Peperomia obtusifolia**
Piper pellucidum = **Peperomia pellucida**
Rhynchophorum floridanum = **Peperomia obtusifolia**
Rhynchophorum obtusifolium = **Peperomia obtusifolia**
Rhynchophorum spathulifolium = **Peperomia magnoliifolia**

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